United States
Department of
Agriculture

Soil
Conservation
Service

Champaign
Illinois

Department of
Transportation
Division of
Water Resources

Illinois

FLOODPLAIN MANAGEMENT RECONNAISSANCE STUDY REPORT

VILLAGE OF SENECA

LASALLE COUNTY, ILLINOIS

FLOODPLAIN MANAGEMENT

RECONNAISSANCE STUDY

Prepared by

US DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Champaign, Illinois

In cooperation with

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

DIVISION OF WATER RESOURCES

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RECONNAISSANCE STUDY

INTRODUCTION

Use of floodprone areas can be a severe problem in Illinois. Urbanization and floodplain encroachment are increasing the severity of this problem. Over 800 communities in Illinois have been identified as having flood problems.

The Illinois Division of Water Resources (DWR) is the responsible state agency for urban flood control and for setting priorities of flood studies within urban areas. The Soil Conservation Service is providing assistance to the Division of Water Resources in setting these priorities. A joint coordination agreement was executed between the Division of Water Resources, State of Illinois, and the USDA, Soil Conservation Service on April 30, 1976 and revised in December 1978 to furnish technical assistance in carrying out Flood Hazard Studies. These studies are carried out in accordance with Federal Level Recommendation 3 of "A Unified National Program for Floodplain Management", and under Section 6 of Public Law 83-566. A plan of study was executed in October 1985 for reconnaissance studies for 10 Illinois communities. These reconnaissance studies will utilize existing floodplain information, historical high water profiles, and the 100 year floodplain from flood insurance studies when available. Average annual damages are estimated for the structures within the floodplain.

The study was conducted and the report provided to: 1) evaluate needs for additional future studies, 2) estimate average annual damages, 3) provide an updated estimate of the 100 year floodplain map, and 4) provide guidance and recommendations to the community for improved floodplain management.

STUDY AREA DESCRIPTION

The Village of Seneca is located in LaSalle County, approximately 15 miles east of Ottawa. The population of Seneca is 2,098, according to the 1980 census.

Transportation facilities within the Seneca area consist of Interstate Route #80, United States Route #6, Illinois Route #170, The Chicago, Rock Island and Pacific Railroad, and the Illinois River which has major barge transportation throughout its length. Other state or county roads are located within a short distance of Seneca.

The Illinois-Michigan Canal is located to the north of the Illinois River. When originally constructed, it was considered to be very important for shipping materials from various communities. After the railroads were constructed, its importance declined to a point where the entire Canal was abandoned for shipping purposes. Brush and trees were allowed to grow over the years, making vast parts of the canal useless for an outlet of surface water drainage and creating a shallow water holding basin that has caused problems for the nearby communities.

The main floodwater problems to the Village of Seneca are caused by the Illinois-Michigan Canal, Crotty Creek, Rat Run, and the Illinois River. Crotty Creek has a drainage area of 1.0 square mile, while Rat Run has a drainage area of 4.8 square miles. The drainage area of the Illinois River at the Seneca gauge station #05543000, is 8,201 square miles. The drainage area of the Illinois-Michigan Canal is unknown because of the manner of construction with ditches and creeks flowing under the canal at many locations. The drainage is in the Mississippi River Basin, hydrologic unit #07120005-090.

The community is located in an area that is mainly agricultural. Because of the very steep terrain, some grassland and woodland areas remain in the watershed. The ditches in the immediate area are narrow and winding, with trees and brush growing along the banks. Most of these outlets have been left in their natural state and have not been cleaned out for several years. Because of this condition, trees, brush and debris at times blocks or restricts the flow of the outlet ditches. The Illinois-Michigan Canal was reshaped last year from the east edge of Seneca to an outlet at the Illinois River, a distance of approximately 2.5 miles. Since this had not been done for several years, considerable expense ($300,000) was involved to complete this project.

Due to the intense cropping systems and/or steepness of the land, runoff water from the rolling cropland north of Route #6 is very rapid. Even with the small amount of cropland which is mainly corn and soybeans, the runoff rate has been accelerated. Fall tillage and excessive spring tillage is still being done at a rate that is leaving the soil in a highly erodible state for runoff water.

The watershed south of US Route #6 is very flat with the majority of the slopes being in the 0 - 2% range. Several trees remain in these flat areas, especially along the railroad and the existing drainageways. In most of these areas, the trees will probably be left in their natural state as removal would be cost prohibitive.

Annual precipitation for the area is normally 33 inches, including an average of 25 - 27 inches of snowfall. More than half of the annual precipitation normally falls during the growing season from May to September. The average growing season is 175 days in LaSalle County.

The main soils in the community are Brenton silt loam and Hesch complex which is fine sandy loam or loamy sand. The soils from the rolling terrain north of US Route #6 are: Bryce, Chatsworth, Frankfort, Morley, Nappanee, Swygert, and Varna. All of these are silt loams except Bryce which is a silty clay. Chatsworth, Morley, and Varna are moderately well to well-drained soils. The remaining soils are somewhat poorly and poorly drained soils.

The soils south of US Route #6 and north of the Illinois River are: Bryce and Wabash silty clays, Millsdale and Sawmill silty clay loams, Brenton silt loam, Shadeland loam, Hesch fine sandy loam, and Hesch complex which is mentioned earlier. These soils will range from somewhat poorly drained to very poorly drained except for the Hesch complex which is well drained.

NATURAL VALUES

The Village of Seneca is located in an agricultural area that is characterized by mainly corn and soybean rotations. Several patches of timber and wooded areas are located around Seneca. Some grassland and legumes are present in the area. These areas and the Illinois River, help provide a large amount of varying quality habitat as well as important travel routes for wildlife.

The wide variety of plant and animal species present, generally make the area a pleasant place to live, work and play.

FLOOD PROBLEMS

Flooding of the Illinois River can happen at any time of the year because of the very large drainage area. However, most of the problems occur in the early spring, due to snow melt and a combination of heavy spring rains on saturated ground. The larger flooding events can last for several days and can cause local flood damage in addition to slowing normal river transportation and drainage into the river from its many tributaries.

The Illinois-Michigan Canal had very little maintenance for several years. Many trees, brush, sediment and debris, made it almost useless for any form of drainage and it became a shallow, stagnant and smelly mosquito breeding area. In 1985, the canal was reshaped with a 10' bottom and 2:1 side slopes from the east side of Seneca to the twin 72" corrugated metal pipe outlets that drain into the Illinois River. This was a total distance of approximately 2.5 miles and should vastly improve the existing drainage network.

Crotty Creek has a small drainage area, but large intense rainfalls on the very steep land causes rapid runoff which the existing culvert system cannot handle. The intersection at US Route #6 and Illinois Route #170 has been closed on several occasions because of excess surface water standing or flowing on the highway. Some of the surface water flows to the south before it reaches the box culvert at the intersection. Portions of this diverted drainage will then outlet into the I&M Canal at a different location than it should.

Rat Run also floods because of local intense rainfall and like Crotty Creek, flooding is usually of a short duration because of the small watersheds on these tributaries.

Basement water damage is a common problem for the residents of Seneca. Over one-half of the basements have had various water related problems. A combination of high water tables, low basements, and sewer back-ups have left many homeowners quite unhappy. Sump pumps are extensively used in the community.

The village storm sewer system cannot handle the larger runoffs during the intense and heavy rainfall periods but will be updated when funds become available.

A new sewage treatment plant went into operation in May of 1986. At the present time, only residents within 100' of the sewer lines were required to "hook up" to the new facilities. An old primary treatment plant was in operation before the new plant was installed. It is estimated that 65 to 70 percent of all homes are still using septic systems, which at certain times do not function properly because of improper designs for existing soil types in the community. Eventually, all homes will be required by EPA mandate to have a proper connection with the sanitary sewage treatment plant which is located above the existing 100 year frequency storm floodplain.

The village has no flooding problems with its water supply as the wells are located above the 100 year frequency storm floodplain.

PROBLEM SUMMARY

Estimated average annual damages from floodwaters to the problems listed area as follows:

Number of Homes/Trailers	Number of Garages/sheds	Number of Businesses	Total Value	Average Annual Damages
54	29	11	$5,221,000	$113,000

Additional damages due to flooding and water related problems:

Approximately 200 wet basements	8000
Outside A/C units	300
Street maintenance & extra clean up	5000
Yard damages	3000
Boats at marina on Illinois River	10000
Total additional damages	$26,300

Total estimated average annual damages for the Village of Seneca equals $139,300. It is estimated that the flooding starts at the 1.3 year frequency storm.

Average annual damages for Crotty Creek are $101,300 with water overtopping highway Route #6 during the 1.3 year frequency storm and entering the east subdivision (east of Commerce Street north of the I&M Canal) during the 2 year frequency storm. Average annual damages for Rat Run are $13,000 and the Illinois River flooding is approximately $25,000 each year.

EXISTING FLOODPLAIN MANAGEMENT

The Village of Seneca has participated in the regular phase of the National Flood Insurance Program since February 1, 1985. Business and home owners may purchase flood insurance. The city does require building permits and zoning ordinances are in effect. At present, construction of homes in a subdivision at the northeast corner of the community has been stopped until solutions are found to ease the water related problems.

RECOMMENDATIONS

It is recommended that the Village of Seneca continue to participate in the National Flood Insurance Program.

Basement drains and sump pumps should not outlet into the sanitary sewers as the increased flow could overload the existing system and cause backup problems in basements, as well as increase village treatment costs.

Any homes that suffer from sanitary sewer back ups should install a backwater check valve to prevent this from happening. Information on these devices can be obtained from the Illinois Department of Transportation, Division of Water Resources booklet, "Protect Your Home From Flood Damage" (contact the Illinois Division of Water Resources, 310 South Michigan Avenue - Room 1606, Chicago, Illinois 60604.

Existing septic systems must be kept in proper working condition to avoid possible health hazards. Since the seasonal groundwater table is very high in the spring of the year, these systems will require more care at this time. Poorly functioning systems will cause standing ponded water that is stale and foul smelling for the homeowners, neighbors, children and increase the mosquito problem. Eventually, all homes should and probably will be required to "hook up" to the village's sanitary sewer as more feeder lines are put into the system. If new septic systems are installed, they should have an adequate filter field attached to the septic system. Correct procedures for installing the proper type of system may be obtained from the local Soil and Water Conservation District office and the County Health Department.

Because of the existing soils with either high water tables or shallow to bedrock, the village should regulate or restrict construction of excavated crawl spaces and one-half or full basements to alleviate and/or prevent potential water related problems.

The Illinois-Michigan Canal that was "cleaned out" last year should have a maintenance program that would allow it to be kept in a proper functioning condition as a course for surface runoff to reach the Illinois River. Because of the small amount of grade in the channel (.09%), brush, trees, debris, and sediments cannot be allowed to remain in the channel if proper drainage is to be maintained.

Proper sized culverts and/or box culverts must be used to insure that the surface runoff can be handled with as few problems as possible.

This year, a Watershed Land Treatment Program for Crotty Creek was implemented by the Soil and Water Conservation District. Designed for a 2 year construction period, with 75% cost sharing on major engineering practices, such as terraces, waterwaysm and structures. This plan will reduce the peak runoff by approximately 28% when completed and will ease flooding problems for Crotty Creek and the community. After completion, operation and maintenance should be a part of the overall plan that will allow the project to benefit the landowners and community for many years.

The village should develop an emergency action plan with the county Emergency Services and Disaster Agency (ESDA) assuming the leadership.

It appears that a 1 1/2' berm could be constructed north of US Route #6, and on the south bank of Crotty Creek that would keep the approximate 10 year frequency storm from overtopping the highway. Properly sized culverts and openings along Crotty Creek, in combination with a good maintenance program would also help to reduce the existing damages associated with this stream. More detailed surveys and calculations would be required to implement a plan of construction for such a project. In addition, it appears that a larger channel in this area would handle the runoff water, but permission must be obtained from the proper authorities before construction is approved.

The channel along the east subdivision should be approximately doubled in size to convey the 10 year frequency storm without causing excess property damage. This would also include the removing of the twin 4'x 6 1/2' corrugated metal arch pipes located along Commerce Street and replacing them with a bridge that will not restrict the flow of water.

A medium priority should be assigned for future detailed floodplain management studies dealing with structural solutions to the flood problems in Seneca by the State of Illinois.

Limited calculations of channel, culverts, and peak discharges were made as a part of this study. The inventory of flooding and water problems is based on a field review and interviews with local citizens. Interviews with local citizens were used to determine the 100-year floodplain. The 1985 Flood Insurance Rate Map for Seneca, along with interviews with local citizens, was used to determine the 100-year floodplain. Aerial photographs were provided by DWR. Damages were based on property value estimates during the field review, and the application of damage factors. These factors came from previous detailed floodplain management studies.


VICINITY MAP
SENECA
LASALLE CO., IL.
SCALE- 1" = 12 MILES
N

LEGEND

CORPORATE LIMITS

100 YEAR FLOODPLAIN

SURFACE WATER

Note

"THIS MAP WAS DEVELOPED FROM AVAILABLE HISTORIC DATA AND OTHER FIELD REVIEWED INFORMATION. NO DETAILED HYDROLOGIC OR HYDRAULIC ANALYSES WERE MADE."

NORTH

400' 0' 400'

APPROXIMATE SCALE

CROTTY CREEK

ILLINOIS MICHIGAN CANAL

Illinois River

(NOT IN CORPORATE LIMITS)

COLEMAN ADDITION

SENECA
LA SALLE CO. IL

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Drawn Pam Spivey 3/6/86

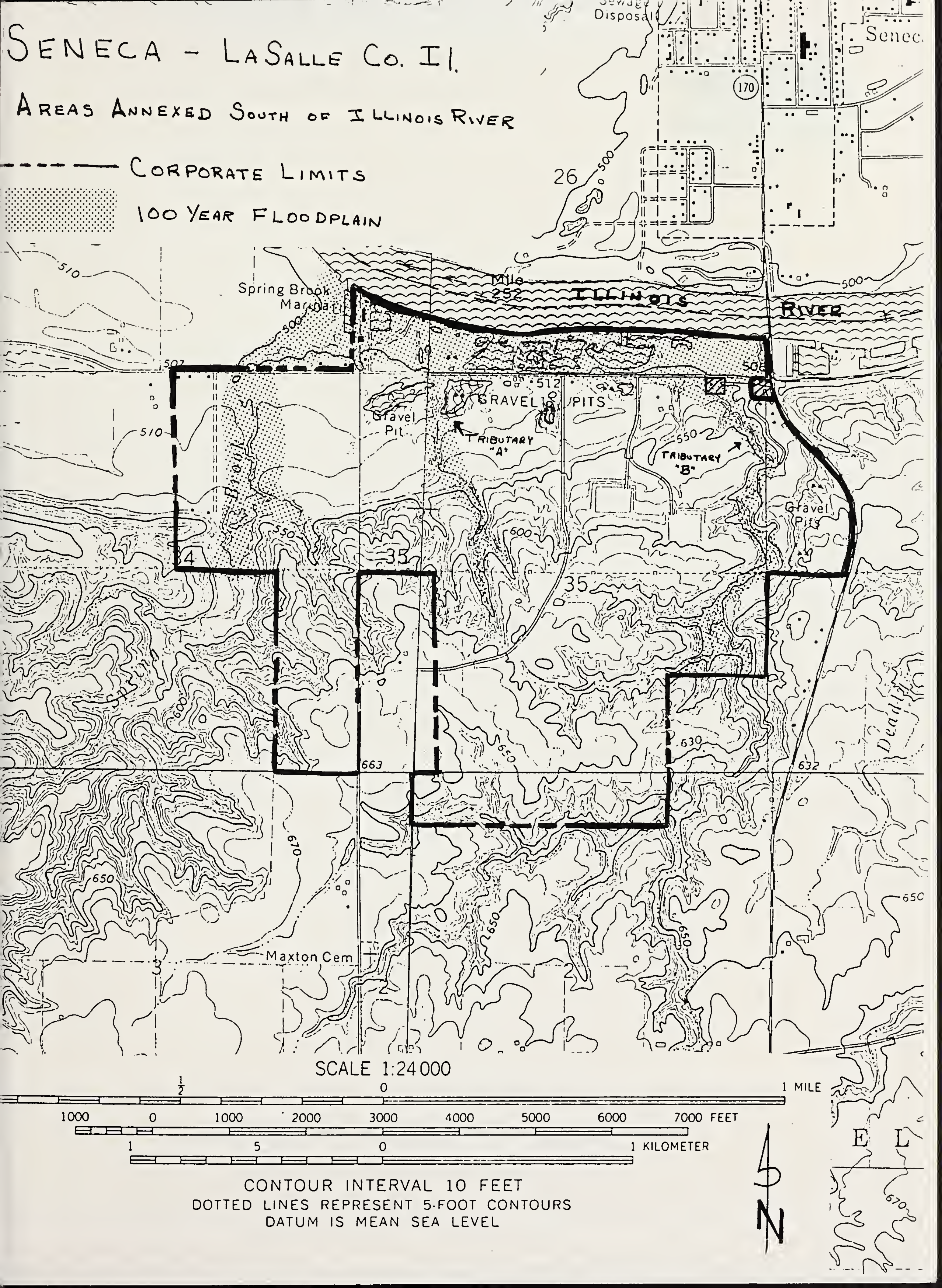
ANNEXED PROPERTY SOUTH OF ILLINOIS RIVER

Since July of 1986, several acres of property south of the Illinois River (see attached floodplain map) have been annexed to the Seneca corporate limits. At present, a minimum number of residences are located in this area. Two boat marinas are located in this vicinity and both suffer from flood waters, mainly associated with the Illinois River flooding.

Three small drainage areas pass through the annexed area. Spring Brook, on the west edge of the area, has a drainage area of 2.1 square miles. Tributary A, in the middle of the area, has a drainage area of .3 square mile, while Tributary B, on the eastern edge has a drainage area of 2.8 square miles.

Only minor home construction has taken place south of the blacktop road from Marseilles to Seneca. However, new home construction should be kept away from the floodplain that is shown on the attached map.

Since the existing properties were included on the original damage estimates for the Village of Seneca, additional property loss calculations were not necessary at the present time.



SENECA - LASALLE CO. IL.
AREAS ANNEXED SOUTH OF ILLINOIS RIVER
CORPORATE LIMITS
100 YEAR FLOODPLAIN
Disposal
Senec
170
26
500
510
Spring Brook Marina
Mile 252
ILLINOIS
RIVER
507
508
512
GRAVEL PITS
Gravel Pit
TRIBUTARY "A"
TRIBUTARY "B"
550
Gravel Pits
600
34
35
630
632
650
663
670
Maxton Cem
3
2
SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL
N